

REMARKS

Status of the Claims:

Claims 1, 37, 38, and 52 have been amended. Claim 53 has been added. Claim 51 has been cancelled. After amending the claims as set forth above, claims 1-50, 52, and 53 are now pending in this application.

I. Claim Rejections – 35 U.S.C. § 112

A. First Paragraph of U.S.C. 112

Claims 1, 37, and 38 have been rejected under 35 U.S.C. 112 as failing to comply with the written description requirement.

Claims 1, 37, and 38 have been amended to incorporate the features of claim 51, which replace the portion of each respective claim that the Examiner noted as failing to comply with the written description. As such, the rejection is moot, and therefore Applicant respectfully requests the rejection of claims 1, 37, and 38 be withdrawn.

B. Second Paragraph of U.S.C. 112

Claims 1, 37-38, and 52 have been rejected under 35 U.S.C. 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 37, and 38 have been amended to incorporate the features of claim 51, which replace the portion of each respective claim that the Examiner noted as being indefinite. As such, the rejection is moot, and therefore Applicant respectfully requests the rejection of claims 1, 37, and 38 be withdrawn.

Claim 52 has been amended to recite “the second musical tone signal,” as suggested by the Examiner. As such, Applicant respectfully requests the rejection of claim 52 be withdrawn.

II. Claim Rejections – 35 U.S.C. § 101

Claim 37 has been rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory matter.

Applicant has amended claim 37 to recite a computer system comprising a detector, an input device, a frequency divider, and a processor. For example, claim 37, as amended, recites among other features:

- analyzing a first musical tone signal with the detector to detect formant characteristics of the first musical tone signal;
- inputting a second musical tone into the input device signal that corresponds to specified pitch information;
- dividing the second musical tone signal with the frequency divider into a plurality of frequency bands, the respective center frequencies of which have been fixed;
- setting modulation levels with the processor only at the fixed center frequency of each of the frequency bands based on the formant characteristics and formant control information with which the formant characteristics detected by the formant detection means are changed; and
- modulating with the processor a level of a signal of each of the frequency bands based on the modulation level.

As such, the Applicant believes claim 37, as amended, is in compliance with 35 U.S.C. 101. Accordingly, Applicant respectfully requests the rejection of claim 37 be withdrawn.

III. Claim Rejections – 35 U.S.C. § 103

A. The Choi, Cano, and Gibson References

Claims 1-50 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Choi (US 2003/0014246) and Cano et al. (Voice Morphing System for Impersonating in Karaoke Applications) (Cano). These rejections are respectfully traversed in view of the claims as amended herein.

Independent claim 1 recites a system comprising:

- formant detection means for analyzing a first musical tone signal to detect formant characteristics of the first musical tone signal;
- musical tone signal input means for inputting a second musical tone signal that corresponds to specified pitch information;
- division means for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed;
- setting means for setting modulation levels only at the fixed

center frequency of each of the frequency bands, relative to other frequencies of each of the frequency bands, based on the formant characteristics and formant control information with which the formant characteristics detected by the formant detection means are changed; and

modulation means for modulating a level of a signal of each of the frequency bands based on the modulation level set in the setting means.

(Similar features are found in independent claims 37 and 38.)

Thus, a setting means sets modulation levels only at the fixed center frequency for each of the frequency bands.

Claim 1 incorporates features found in claim 51, which according to the Examiner would be allowable if rewritten in independent form. See Office Action dated February 18, 2010 at p. 27 ll. 1-3 (Office Action).

Furthermore, Choi, Cano, and Gibson, alone or in the combination suggested by the Examiner does not teach, suggest, or render predictable a system, as recited in claim 1, including these features.

According to the Examiner, Choi discloses:

a vocoder system comprising: formant detection means for analyzing a first tone signal to detect formant characteristics of the first tone signal ("voice signal of the subscriber... detect the spectrum parameter", paragraph 46; "spectrum parameter... are detected", paragraph 47; where the spectrum of a signal comprises, among other things, the formants of a voice) tone signal input means for inputting a second tone signal that corresponds to specified pitch information ("selects the kind of the effect. ... converts the spectrum parameter... with reference to the loaded spectrum parameter... conversion of the spectrum parameter... height of voice", paragraph 47) setting means for setting modulation levels, relative to other frequencies based on the formant characteristics and formant control information with which the formant characteristics detected by the formant detection means are changed ("selects the kind of the effect... converts the spectrum parameter... with reference to the loaded spectrum parameter... conversion of the spectrum parameter... height of voice", paragraph 47; "modulating", paragraph 38; see Response to Arguments,

where interpolating one part of the spectrum where the input and target are relatively similar necessarily has a different modulation set relative [i.e. compared to] other modulated frequency values/levels in other frequencies where the difference between the input and target are different.) modulation means for modulating a level of a signal based on the modulation level set in the setting means ("modulating", paragraph 38).

See Office Action p. 9 l. 13 to 9. 10 l. 9. However, as acknowledged by the Examiner, Choi fails to teach the tone *signals* are musical tone signals. *See Office Action* at p. 10 l. 10.

As a result, the Examiner cites the Cano reference, which according to the Examiner “teaches the tone signals are musical tone signals ("target singer", Introduction). “ *See Office Action* at p. 10 ll. 11-12. However, as acknowledged by the Examiner,

Choi, in view of Cano, fail to teach division means for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed, where the modulation levels are set at the fixed center frequency of each of the frequency bands, and where modulating the level of a signal modulates levels of each of the frequency bands, and where the frequencies are of each of the frequency bands.

See Office Action at p. 10 ll. 17-22. As a result, the Examiner cites the Gibson reference, which according to the Examiner:

suggests division means for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed, where the modulation levels are set at the fixed center frequency of each of the frequency bands, and where modulating the level of a signal modulates levels of each of the frequency bands, and where the frequencies are of each of the frequency bands ("signal is split into two equal-width frequency bands... gain compensation ... transformed ", col. 9, lines 44-65; "summing a gain-compensated high-frequency signal and the transformed low-frequency component", col. 9, line 65 - col. 10, line 2; "source and target voice signals", col. 7, lines 17-28; where, to determine the target voice characteristics and the necessary transformations, an analysis of the target voice signals in the corresponding frequency bands is obvious/necessary).

See Office Action at p. 11 ll. 1-11.

However, the Gibson reference does not address the distinction between claim 1 and the Choi and Cano references. The Gibson reference fails to disclose setting modulation levels only at the fixed center frequency for each of the frequency bands. Indeed, the Gibson reference discloses changing values at other frequencies as well. *See* Gibson at col. 7 ll. 22-29 (disclosing five methods of spectral modification for “scaling the spectral envelope [of a user’s voice] to more closely match the timbre of the target vocal signal”); *see, e.g.*, col. 7 ll. 30-50 (applying a conformal mapping to the transfer function of a digital filter); col. 7 ll. 51-57 (finding singularities (i.e., poles and zeros) of a digital filter transfer function and then modifying the location of these singularities to generate a new digital filter having the desired spectral characteristics); col. 8 ll. 12-15 (shifting a spectral envelope in frequency by a certain percentage); col. 8 ll. 18-23 (manipulating a frequency-transformed representation of a signal); col. 8 ll. 24-28 (decomposing a digital filter transfer function into multiple lower-order sections and then modifying the lower-order sections using previously-described methods).

As such, the Gibson reference does not disclose setting modulation levels only at the fixed center frequency for each of the frequency bands.

To establish a prima facie obviousness of a claim invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981 (CCPA 1974). Because none of the references disclose or suggest the recited features, there can be no prima facie obviousness by seeking to combine these references.

Therefore, for at least the reasons above, Choi, Cano, and Gibson do not anticipate, suggest, or render predictable independent claims 1, 37, and 38. Claims 2-36 and 41-50 depend from claim 1 (directly or indirectly) and are allowable for at least the same reasons as claim 1 is allowable. Claims 39 and 40 depend from claim 38 (directly or indirectly) and are allowable for at least the same reasons as claim 38 is allowable. Accordingly, the rejections of claims 1-50, as amended herein, are respectfully traversed.

B. The Choi, Cano, Gibson, and Flanagan References

Claim 52 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Choi, Cano, Gibson, and Flanagan (US 4,374,304). These rejections are respectfully traversed in view of the claims as amended herein.

Independent claim 52 recites a system comprising:

formant detection means for analyzing a first musical tone signal to detect formant characteristics of the first musical tone signal;

musical tone signal input means for inputting a second musical tone signal that corresponds to specified pitch information;

filtering means for dividing the second musical tone signal into a plurality of frequency bands based on respective fixed center frequencies;

setting means for setting modulation levels only at the fixed center frequency of each of the frequency bands based on the formant characteristics and formant control information with which the formant characteristics detected by the formant detection means are changed; and

modulation means for modulating a level of a signal of each of the frequency bands based on the modulation level set in the setting means.

Claim 52 is neither taught, suggested, nor rendered predictable by Choi, Cano, Gibson, and Flanagan, alone or in the combination suggested by the Examiner. Claim 52 is allowable at least for the reasons discussed with respect to claims 1, 37, and 38. In particular, Choi, Cano, and Gibson do not disclose setting modulation levels only at the fixed center frequency for each of the frequency bands.

The Examiner cites Flanagan, which according to the Examiner, “teaches where the division is based on respective fixed center frequencies (‘partition the received signal into subbands having center frequencies’, col. 8, lines 44-62; where Flanagan teaches that the division of a signal into subbands can be based on what the center frequencies are).” *See Office Action* at p. 26 ll. 9-12.

However, Flanagan does not disclose the previously discussed features missing in Cano, Choi, and Gibson.

To establish a prima facie obviousness of a claim invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981 (CCPA 1974). Because none of the references disclose or suggest the recited features, there can be no prima facie obviousness by seeking to combine these references.

Therefore, for at least the reasons above, Choi, Cano, Gibson, and Flanagan do not anticipate, suggest, or render predictable independent claim 52. Accordingly, the rejections of claim 52, as amended herein, are respectfully traversed.

IV. New Claims:

New claim 53 is added to further protect additional features of the present invention.

Claim 53 generally recites, among other features, a formant changer for changing the formant characteristics detected by the formant detector, the formant changer for changing the formant characteristics based on the formant control information. This claim is supported by the original application, for example, in paragraph [0039]. This claim is not disclosed in the cited reference(s). Moreover, this claim is believed to be allowable at least for the reasons of its parent claims and/or the reasons previously discussed.

V. Conclusion:

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of

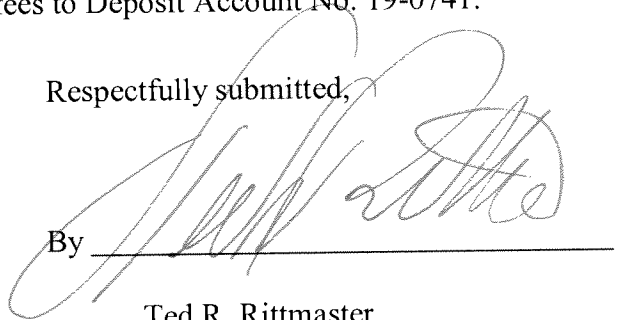
papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date

5-12-10

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